

TITLE: THE EFFECTS OF ENVIRONMENT ON THE SURFACE CHEMISTRY OF  
NICOTIANA

AUTHORS: J. A. Weybrew\*, K. W. Chang, and W. W. Weeks

AFFILIATION: North Carolina State University,  
Raleigh, NC 27650

ABSTRACT: Seeds of the flue-cured variety NC 2326, of ancestral species N. sylvestris and N. tomentosiformis, and of the Oriental cultivar, Xanthi, were germinated in the Phytotron and the plants were grown to anthesis in the glasshouse at 26/22°C day/night temperatures. Then fifteen plants of each were moved into growth chambers--controlled at 32/26°C and 12 hr day-length to simulate the climate at Latitude 6°; at 32/21°C and 14 hr approximating Lat. 33°; and at 21/12°C for 16 hr duplicating Lat. 45°--to mature and senesce. Chloroform lavages of leaf samples taken at the time of transfer and after 15 days and 30 days were analyzed by capillary GC. At termination, the remaining leaves were "cured", and their steam-distillates were also analyzed. The differential responses to the environments as well as among cultivars will be demonstrated with data on selected constituents.

REVIEW: In this work, differences in surface chemistry due to environment were examined. GC analysis was used to monitor differences in quantity of 49 selected surface constituents which were removed by chloroform extraction. In the warmer climate the flue cured NC 2326 and Oriental cultivar, Xanthi, produced larger quantities of duvanes, duvane diols, and duvane ethers than did the tobacco species N. sylvestris and N. tomentosiformis. Both of these species produced more of the surface constituents in a cooler environment. The steam distillates of the cured tobacco showed a similar pattern. The NC 2326 and Xanthi grown in a warmer climate had greater quantities of steam volatile oils. Because the surface chemistry of a leaf is related to its aroma, the author concluded that differences in aroma and taste of various types of tobacco will be altered by a change in the environment in which it is grown.

-Reviewed by S. Wrenn

1000816902